

E-governance in eastern and southern Africa: A webometric study of the governments' websites

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This chapter explores the adoption of one of the information and communication technology tools, namely the Internet and, more particularly, the World Wide Web, by eastern and southern African governments as a means of facilitating interactions between the state and its citizens. It was observed that most governments in the region have constructed their own websites, some of which are up to date. English is the most commonly used language to prepare the websites. Other findings include that foreign missions recorded the highest number of webpages, followed by political parties; the .com or .co top-level domain generated most webpages, followed by .ac or .edu in each country; most governments provide contact information as opposed to sitemaps and feedback forms, which recorded relatively few postings; governments with few webpages and large quantities of in-links (including self-links) recorded high web impact factors; and only the South African government provided links to other eastern and southern African governments. Ethical issues regarding the analysed variables, as well as conclusions and recommendations, are discussed.

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Introduction

Information and communication technologies (ICTs) are increasingly becoming important tools with which individuals, corporate institutions and organisations and even countries not only create, store, disseminate and use information, but also market their services and products. The Internet, being one of the modern ICT tools, offers several opportunities and services, such as electronic commerce, web-based education, electronic mail and electronic governance. E-governance is defined as follows (Jensen, 2002):

... the use of ICTs to promote efficient and effective government, facilitate more accessible government services, allowing greater public access to information, and making government more accountable to citizens.

E-governance involves the delivery of government services and information to the public using electronic means. The United Nations Educational, Scientific and Cultural Organisation provides an elaborate definition (UNESCO, 2005):

... the public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective.

Backus (2001) gives e-governance a commercial impetus. The author argues that e-governance is a form of e-business in governance and defines it as the application of electronic means in the interaction between the government and citizens and between the government and businesses, as well as in internal government operations, in order to simplify and improve the democratic, government and business aspects of governance.

According to Chisenga (2004), e-governance is meant to fulfil the following goals:

- Improve the internal organisational processes of governments
- Provide better information and service delivery
- Increase government transparency in order to reduce corruption
- Reinforce political credibility and accountability
- Promote democratic practices through public participation and consultation

An audit of the technological developments in Africa indicates that most governments on the continent are vigorously promoting the use of ICTs in the provision of services to their citizens. A study conducted by Chisenga (2004) noted that the majority of the African governments are finding their way into cyberspace through the construction of their own websites. It has been observed, however, that the mere ownership of a website does not mean effective e-governance (Waiswa, 2006). Quoting Dr Subhajit Basu, a lecturer at Queen's University in Belfast, Vincent Waiswa agrees that ICTs only support and stimulate good governance. Websites, nevertheless, are essential tools (and sometimes prerequisites) for governments to realise or attain any effective e-governance.

According to Sangonet (in Chisenga, 2004), the following benefits can be realised if governments distribute their information through ICT tools such as the Internet and the Web:

- It costs less than print distribution.
- Broad distribution can be achieved at relatively little cost.
- Speedy distribution is possible at low cost.
- More information can be made accessible at lower costs.
- The government is therefore able to provide more information to the public than before.
- Different, but important, types of information can be distributed (staff members of departments, contact details, etc.).
- Access can be provided to information in remote or rural areas.
- People can respond and/or put their views across.
- It puts into effect commitment to transparency, accountability and democratisation.

Commenting on the benefits of e-governance in China, Kluver (2005:76) argues that:

... e-government initiatives in China have had as their purpose not the empowerment of citizens, nor even to attract external investment, but rather to add stability and order to a chaotic governing process and social change, and to reestablish the control of the governing authorities, including improving the quality of surveillance and data gathering, and hence policy-making, the elimination of corruption, and ultimately, the re-legitimation of the Communist Party of China.

Bar-Ilan (2005:975) defines the Web as an "enor-

mous set of documents connected through hyper-text links created by authors of web pages". In addition, links are used to improve the performance of information retrieval systems on the Internet, and more so the Web. Therefore, for a person to access government information successfully, he or she would be required to follow particular links as provided by webpage authors, commonly known as webmasters. Links that are not well constructed or active (broken or dead links) would make information access and government-to-citizen or government-to-business interactions impossible. This would render the whole system of e-governance null and void, for it is through the web links that citizens or the business community can reach, and be reached by, the government.

In view of the above, an evaluation of websites in terms of content and links (to and from other websites) would help to measure the performance of the various governments on the Web. This would provide valuable information that can be used in formulating relevant policies for improving the situation, specifically as regards service delivery through the Internet and Web.

The purpose of the study

This study sought to examine the broad performance and impact of eastern and southern African governments on the Web with a view to determining their visibility and impact. These research questions were used to inform the study:

- How many countries in eastern and southern Africa have constructed government websites?
- Which is the language used most commonly to prepare the websites?
- How up to date are the government websites?
- How many government and government-related institutions own websites in each country?
- Does each government website provide essential features (e.g. feedback forms, search engines, contact details, site maps)?
- How much has each government's site contributed in terms of webpages in each country?
- What is each government's web influence or impact?
- Are there any interlinkages between eastern and southern African governments' websites? If so, what is the nature or type of these linkages?

Methods and procedures

The study employed two approaches, namely link and content analyses, to gauge the presence and impact of eastern and southern African governments on the Web. A total of 20 countries were targeted for this purpose: Angola, Botswana, Djibouti, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Seychelles, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. The study relied heavily on the Internet to obtain website addresses for each country. Three Internet-based online sources provided links to African countries on the Web:

- African governments on the WWW: <http://www.gksoft.com/govt/en/africa.html>
- African governments on the Internet: <http://www.uneca.org/aisi/NICI/africagovinternet.htm>
- Foreign governments in Africa: <http://www.lib.umich.edu/govdocs/forafr.html>

These three sources provide links to a variety of websites of a given country which, in turn, provide various access points to African governments' home pages. Government ministries or departments, state houses or presidents, national assemblies or parliaments, prime ministers, etc. are some of the national institutions whose home pages are provided by these sites. Others include representations in foreign countries (foreign missions and high embassies) and political parties. At this stage, only a government's official URL address was used to conduct a content and link analysis of eastern and southern African governments. The portal, notes Chisenga (2004), usually provides an "entry point or access point to all or some web sites of executive and legislative organs of the government, and government agencies".

A total of 13 government portals were identified (Table 1). However, when the time came to access these websites, those of Djibouti, Namibia and Uganda were inaccessible, with the common website access error ("the page cannot be displayed") popping up. Nevertheless, the websites were used to measure the respective governments' impact using link analysis, thus leaving out a content analysis of that country's website.

In order to perform a link analysis of eastern and southern African governments, two online indexing services – Google (www.google.com) and

| No. | Country | Government website address |
|-----|--------------|---|
| 1 | Botswana | http://www.gov.bw/ |
| 2 | Djibouti | http://www.republique-djibouti.com/ |
| 3 | Kenya | http://www.kenya.go.ke |
| 4 | Lesotho | http://www.lesotho.gov.ls/home/ |
| 5 | Madagascar | http://www.madagascar.gov.mg/ |
| 6 | Malawi | http://www.malawi.gov.mw/ |
| 7 | Mozambique | http://www.mozambique.mz/ |
| 8 | Namibia | http://www.grnnet.gov.na/ |
| 9 | South Africa | http://www.gov.za/ |
| 10 | Swaziland | http://www.gov.sz/ |
| 11 | Tanzania | http://www.tanzania.go.tz/ |
| 12 | Uganda | http://www.government.go.ug/ |
| 13 | Zimbabwe | http://www.gta.gov.zw/ |

Table 1: Eastern and southern African governments' websites used in the study

AltaVista (www.altavista.com) – were used to extract relevant data. A combination of unique search queries was used in each case, as follows:

- The number of links from one government site to another (e.g. from South Africa to Kenya) – Google: *site:gov.za (space) "www.kenya.go.ke"*; AltaVista: *domain:gov.za (space) "www.kenya.go.ke"*. This first search strategy is a bit limited in that hyperlinks are sometimes in the name of a person or institution. For example, the Kenyan government's website can be linked to using either a URL or a name hyperlink (i.e. *Government of Kenya*, or <http://www.kenya.go.ke>). This study used the aforementioned query in the belief that when the hyperlink is in the name of a particular government, the linking page would still provide a URL alongside the name.
- The total number of pages linking to the website – Google: *link:www.gov.za/*; AltaVista: *linkdomain:gov.za/* or *linkdomain:www.gov.za/*
- The total number of pages on the website – Google: *site:gov.za/* or *site:www.gov.za/*; AltaVista: *domain:gov.za/* or *domain:www.gov.za/*

The web impact factor (WIF) was calculated in order to measure each government's web influence (impact) as follows:

$$WIF = \frac{\text{Total number of pages linking to the website}}{\text{Number of pages on the website}}$$

In this study, social networks were constructed using the Pajek computer-aided software. Tables were largely used to present the findings.

Results

Results cover the following sub-themes, which were derived from the purpose of the study and the research questions: language of webpage construction; availability and number of government and government-related institutions that own websites; up-to-datedness of websites; essential features; total top-level domains; the number of in-links and the number of pages; WIF; and governments' interlinkages.

Language of the websites

Of the total of 13 government websites, all except those of Madagascar and Mozambique were prepared in English. Mozambique's website was largely in Portuguese, and the English version of the website was still under construction. In the case of Madagascar, the government's website was constructed in French and there was no English version.

| No. | Country | Government website address | Copyright date | Date of update |
|-----|--------------|---|----------------|----------------|
| 1 | Botswana | http://www.gov.bw/ | 2006 | – |
| 2 | Djibouti* | http://www.republique-djibouti.com/ | – | – |
| 3 | Kenya | http://www.kenya.go.ke | 2005 | 2006 |
| 4 | Lesotho | http://www.lesotho.gov.ls/home/ | – | – |
| 5 | Madagascar | http://www.madagascar.gov.mg/ | – | – |
| 6 | Malawi | http://www.malawi.gov.mw/ | – | – |
| 7 | Mozambique | http://www.mozambique.mz/ | – | – |
| 8 | Namibia* | http://www.grnnet.gov.na/ | – | – |
| 9 | South Africa | http://www.gov.za/ | 2004 | 2006 |
| 10 | Swaziland | http://www.gov.sz/ | – | – |
| 11 | Tanzania | http://www.tanzania.go.tz/ | 2001–2007 | – |
| 12 | Uganda* | http://www.government.go.ug/ | – | – |
| 13 | Zimbabwe | http://www.gta.gov.zw/ | – | – |

Table 2: Government portals' copyright and update dates

Note: Websites indicated with an asterisk were inaccessible.

Up-to-datedness of government websites

Two dates were considered in this analysis: the copyright date and the date of page or site update. In several cases, there were as many different dates as there were web directories, domains or pages on a given government's website. Sometimes each department's website contained dates of update that differed from the portal's date(s). Every effort was made to obtain dates from the government's portal. Where the main portal did not display any date, the page "About us" or "About the government" was used to extract the two dates where possible (e.g. South Africa). In some cases, the date of update was in the form of the "date today" (e.g. Kenya). The latter cases were excluded from the data analysis and only the year of update was considered.

Only countries with government portals were analysed in this section. Table 2 shows that all the websites whose dates were given were up to date and their copyright dates were current. Most sites, however, did not provide the dates of either copyright or update. Kenya and South Africa provided both, proving that the websites were up to date, as 2006 was the year in which this study was conducted.

Government and government-related institutions with own websites

This section presents data extracted from all the eastern and southern African countries, irrespective of whether they had official government websites or not. Table 3 shows the number of government and government-related institutions in each country that had their own websites at the time of the study.

The table reveals that a total of 13 countries had constructed government portals from which most departments and other government-related institutions could also be accessed, apart from directly accessing their websites with their own URLs. These countries include Botswana, Djibouti, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda and Zimbabwe. South Africa leads in the number of government and government-related institutions that have websites (92), followed by Uganda (29), Kenya (25) and Ethiopia (23), while Angola, Mozambique and Namibia had 19 such institutions each. (It should be noted that South Africa's total number of institutions does not include the provincial or regional governments and departments.) A comparison of different institutions indicates that

| No. | Country | Gov. portal | Ministries | National Assembly | President/ Prime Min. | Political parties | Foreign missions | Others | Total |
|-----|---------------|-------------|------------|-------------------|-----------------------|-------------------|------------------|--------|-------|
| 1 | South Africa* | 1 | 23 | 1 | – | 11 | 35 | 21 | 92 |
| 2 | Uganda | 1 | 10 | 1 | 1 | 1 | 5 | 10 | 29 |
| 3 | Kenya | 1 | 7 | 1 | 1 | 3 | 7 | 5 | 25 |
| 4 | Ethiopia | – | – | 1 | – | 6 | 9 | 7 | 23 |
| 5 | Angola | – | 5 | 1 | – | 3 | 7 | 5 | 19 |
| 6 | Mozambique | 1 | 6 | – | – | 1 | 2 | 9 | 19 |
| 7 | Namibia | 1 | 7 | – | 2 | 2 | 4 | 3 | 19 |
| 8 | Sudan | – | 2 | – | – | 2 | 13 | 1 | 18 |
| 9 | Madagascar | 1 | 7 | 1 | – | – | 4 | 5 | 17 |
| 10 | Tanzania | 1 | 2 | 1 | – | 2 | 7 | 3 | 16 |
| 11 | Zimbabwe | 1 | – | 1 | – | 4 | 2 | 4 | 12 |
| 12 | Malawi | 1 | 2 | – | – | – | 1 | 5 | 9 |
| 13 | Zambia | – | – | – | – | – | – | 9 | 9 |
| 14 | Lesotho | 1 | – | – | – | – | 2 | 5 | 8 |
| 15 | Swaziland | 1 | 2 | – | 1 | – | 2 | 2 | 8 |
| 16 | Seychelles | – | 1 | – | – | 1 | 1 | 4 | 7 |
| 17 | Botswana | 1 | 3 | – | – | – | 1 | 1 | 6 |
| 18 | Djibouti | 1 | 2 | – | – | 1 | – | 2 | 5 |
| 19 | Somalia | – | – | – | – | – | 1 | 1 | 2 |
| 20 | Eritrea | – | – | – | – | – | 1 | – | 1 |
| | Total | 13 | 77 | 8 | 5 | 37 | 104 | 102 | 344 |

Table 3: Government and government-related institutions that have their own websites in each country

Note: In countries marked with an asterisk, only the national government and government-related institutions were counted, and regional or provincial institutions were not included in the national tally.)

foreign missions belonging to a country were in the majority (104), followed by government ministries (77), political parties (37), government portals (13), national assemblies or parliaments (8), and presidents or prime ministers (5). The government ministry portals provide access to government institutions that fall under the respective ministries.

The category “Others” includes electoral commissions; constitutional commissions; national police; national banks, television stations and radio stations; Office of the Government spokespersons, the national bureau of standards, etc. It should be borne in mind that South Africa’s system of government comprises national and

provincial/regional governments which, in turn, consist of several regional institutions.

Distribution of webpages according to the most commonly used generic TLDs

Five generic top-level domains (gTLDs) – i.e. ac/.edu, .com/.co, .org/.or, .gov/.go/.gv, and .net – that are commonly used to register domain names were selected and used to examine, among other aspects, the share of each government’s gTLDs (i.e. .gov, .go, or .gv) of a country’s total gTLD tally.

Table 4 therefore shows the distribution of

| No. | Country | .co + .com | | .edu + .ac | | .gov + .go + .gv + .government | | .net | | .org + .or | | Total* | |
|-----|---------------------------|------------|------------|------------|-----------|--------------------------------|-----------|--------|-----------|------------|-----------|------------|------------|
| | | Google | AltaVista | Google | AltaVista | Google | AltaVista | Google | AltaVista | Google | AltaVista | Google | AltaVista |
| 1 | South Africa (.za) | 8 160 000 | 18 000 000 | 655 760 | 1 760 000 | 147 000 | 414 000 | 58 | 26 | 406 000 | 1 020 000 | 9 368 818 | 21 194 026 |
| 3 | Uganda (.ug) | 165 000 | 200 000 | 15 900 | 8 540 | 39 400 | 16 200 | 0 | 0 | 32 649 | 15 000 | 252 949 | 239 740 |
| 8 | Tanzania (.tz) | 46 800 | 168 000 | 26 800 | 23 200 | 52 300 | 17 600 | 0 | 1 | 19 500 | 12 300 | 145 400 | 221 101 |
| 5 | Zimbabwe (.zw) | 135 000 | 166 000 | 7 950 | 10 300 | 2 400 | 1 640 | 0 | 0 | 20 500 | 15 100 | 165 850 | 193 040 |
| 7 | Kenya (.ke) | 157 000 | 123 000 | 10 700 | 12 300 | 21 800 | 10 100 | 0 | 0 | 15 200 | 12 500 | 204 700 | 157 900 |
| 6 | Namibia (.na) | 154 000 | 99 200 | 1 440 | 2 550 | 210 000 | 22 000 | 0 | 3 | 25 900 | 5 220 | 391 340 | 128 973 |
| 12 | Mozambique (.mz) | 85 000 | 94 900 | 919 | 626 | 63 200 | 10 400 | 1 | 0 | 12 500 | 7 050 | 161 620 | 112 976 |
| 15 | Swaziland (.sz) | 0 | 7 160 | 357 | 318 | 3 550 | 2 520 | 0 | 0 | 11 800 | 102 000 | 15 707 | 111 998 |
| 10 | Ethiopia (.et) | 111 000 | 2 500 | 15 100 | 7 660 | 11 600 | 12 600 | 15 700 | 32 900 | 2 510 | 1 570 | 155 910 | 57 230 |
| 9 | Zambia (.zm) | 197 887 | 34 300 | 1 218 | 857 | 7 640 | 4 490 | 310 | 135 | 11 800 | 9 730 | 218 855 | 49 512 |
| 4 | Botswana (.bw) | 168 000 | 7 560 | 228 | 98 | 26 200 | 23 300 | 0 | 0 | 2 370 | 1 880 | 196 798 | 32 838 |
| 16 | Lesotho (.ls) | 210 000 | 14 900 | 37 | 12 | 20 800 | 3 620 | 0 | 1 | 2 580 | 2 930 | 233 417 | 21 463 |
| 17 | Malawi (.mw) | 1 524 | 494 | 607 | 2 070 | 1 620 | 1 900 | 0 | 0 | 2 480 | 4 980 | 6 231 | 9 444 |
| 18 | Sudan (.sd) | 23 | 19 | 4 160 | 217 | 28 100 | 4 420 | 5 020 | 714 | 431 | 111 | 37 734 | 5 481 |
| 11 | Madagascar (.mg) | 49 | 34 | 0 | 0 | 56 800 | 4 420 | 0 | 0 | 327 | 216 | 57 176 | 4 670 |
| 14 | Seychelles (.sc) | 562 | 1 380 | 171 | 146 | 893 | 737 | 1 530 | 761 | 20 | 26 | 3 176 | 3 050 |
| 13 | Djibouti (.dj) | 0 | 2 | 25 | 1 990 | 626 | 528 | 0 | 1 | 49 | 35 | 700 | 2 556 |
| 19 | Eritrea (.er) | 2 640 | 302 | 1 940 | 1 650 | 483 | 405 | 0 | 0 | 33 | 63 | 5 096 | 2 420 |
| 2 | Angola (.ao) | 3 270 | 1 530 | 0 | 0 | 11 800 | 818 | 0 | 0 | 0 | 1 | 15 070 | 2 349 |
| 20 | Somalia (.so) | 0 | 35* | 0 | 0 | 0 | 1* | 0 | 2* | 0 | 4* | 0 | 229* |
| | Total | 9 597 755 | 18 921 281 | 743 312 | 1 832 534 | 706 212 | 551 698 | 22 619 | 34 542 | 566 649 | 1 210 712 | 11 636 547 | 22 550 996 |
| | % of total | 82.5 | 83.9 | 6.4 | 8.1 | 6.1 | 2.4 | 0.2 | 0.2 | 4.9 | 5.4 | 100.0 | 100.0 |
| | Average pages per country | 479 888 | 946 064 | 37 166 | 91 627 | 35 311 | 27 585 | 1 131 | 1 727 | 28 332 | 60 536 | 581 827 | 1 127 550 |

Table 4: Number of webpages distributed by the most common generic TLDs (gTLDs)

Note: Somalia's gTLD pages could not be accessed in order to verify their authenticity, although the domain names ended with an .so ccTLD.

webpages according to the gTLDs in each country, as well as the country's total webpages (i.e. pages that contained a country's code TLD, or ccTLD). Table 4 reveals that the country leading in the number of webpages bearing only the country's cTLD was South Africa, which yielded 9 368 818 and 21 194 026 webpages in Google and AltaVista respectively. Other countries performing relatively well (in the order of Google first and then AltaVista) were Uganda (252 949; 239 740), Tanzania (145 400; 221 101), Zimbabwe (165 850; 193 040), Kenya (204 700; 157 900), Namibia (391 340, 128 973), and so on.

Generally, it can also be observed that the .co or .com gTLDs (commercial organisations) recorded the highest number of webpages in most countries, followed by .org or .or gTLDs (non-profit-making organisations) in both indexing services. This pattern emerges when the total number of pages (third row from the bottom of Table 4) is considered. There were a total of 9 597 755 and 18 921 281 .com or .co webpages in Google and AltaVista respectively, while .edu or .ac gTLDs produced 743 312 and 1 832 534 webpages in the two indexing services. Government institutions' webpages (.gov or .go) totalled 706 212 and 551 698 pages, while network infrastructures (.net) produced 22 619 and 34 542 webpages in Google and AltaVista respectively.

Provision of important features on the governments' websites

An examination of the governments' websites for the purposes of finding out the provision of information-related tools or services yielded the results presented in Table 5. Four aspects that are pertinent to citizen-government relationship in e-governance, namely, feedback forms, contact information, sitemaps, and search engines/options were considered.

Table 5 reveals that apart from Lesotho, South Africa and Swaziland, which offered all four features, the remaining countries' websites offered fewer than four. (The websites of Djibouti, Namibia, Uganda and Zimbabwe were not accessible at the time.) Notably, contact information (e.g. contact persons; telephone, fax and cell-phone numbers; email addresses) was provided by nine of the 13 countries, followed by search engines (6), sitemaps (5) and feedback forms (4).

Webpages in, and links to, government portals

Government domain pages on the Web were evaluated in order to compare (using both the Google and AltaVista search indexing services) the visibility and influence of the governmental portals of eastern and southern African countries on the one hand, and the entire or cumulative .go/.gov/.gv government websites on the other hand. As expected, there were more webpages at, and links to, the .go/.gov/.gv government webpages than there were webpages at, and links to, the government portals. For instance, Botswana yielded 22 900 (AltaVista) and 1 620 (Google) government portal webpages, and a total of 23 300 (AltaVista) and 26 200 (Google) government webpages.

As links, the country had a total of 69 500 (AltaVista) and one (Google) government portal webpages and 73 700 (AltaVista) and zero (Google) links to the cumulative government webpages. The same pattern was witnessed in all the other countries.

In Table 6, there were altogether 461 767 governmental portal webpages in AltaVista, while Google yielded a total of 204 667 webpages in the same category. The cumulative government webpages (i.e. all pages containing .go/.gov/.gv gTLDs) were 528 228 and 672 696 in AltaVista and Google respectively. Links to government portal webpages totalled 536 510 (AltaVista) and two (Google), while all government webpages had a total of 631 871 and zero links in AltaVista and Google respectively.

Government web impact factors

Table 6 provides the web impact factors (WIF) for each government, as recorded with both AltaVista and Google.

The WIF was calculated as the ratio of the total in-links to the total webpages at the website(s). The highest WIF was recorded by Djibouti's government portal (701.0 in AltaVista), followed by Uganda (288.0), Zimbabwe (235.3), Kenya (136.0) and Mozambique (47.2), all as reflected in AltaVista. In the case of Google, it was noted that all government portals recorded zero WIF when rounded up to the nearest whole number.

| No. | Country | Feedback forms | Search engine | Contact info | Site map |
|-----|-------------------|----------------|---------------|--------------|--------------|
| 1 | Botswana | x | √ | √ | x |
| 2 | Djibouti | – | – | – | – |
| 3 | Kenya | x | x | √ | x |
| 4 | Lesotho | √ | √ | √ | √ |
| 5 | Madagascar | x | √ | √ | √ |
| 6 | Malawi | x | x | √ | x |
| 7 | Mozambique | √ | x | √ | x |
| 8 | Namibia | – | – | – | – |
| 9 | South Africa | √ | √ | √ | √ |
| 10 | Swaziland | √ | √ | √ | √ |
| 11 | Tanzania | x | √ | √ | √* |
| 12 | Uganda | – | – | – | – |
| 13 | Zimbabwe | – | – | – | – |
| | Total occurrences | √ = 4, x = 5 | √ = 6, x = 4 | √ = 9, x = 0 | √ = 5, x = 4 |

Table 5: Governments' provision of feedback forms, search engines, contact information and site maps

Note: The site marked with an asterisk did not have a site map option, but indicated the option "About this site".

| No. | Country | Government portal only | | Government sites (collectively) | |
|-----|--------------|------------------------|--------|---------------------------------|--------|
| | | AltaVista | Google | AltaVista | Google |
| 1 | Botswana | 3.0349 | 0.0006 | 3.1631 | 0.0000 |
| 2 | Djibouti | 701.0000 | 0.0000 | 1.3277 | 0.0000 |
| 3 | Kenya | 136.0000 | 0.0000 | 3.2673 | 0.0000 |
| 4 | Lesotho | 1.2359 | 0.0000 | 2.1188 | 0.0000 |
| 5 | Madagascar | 6.2867 | 0.0000 | 1.1403 | 0.0000 |
| 6 | Malawi | 1.7643 | 0.0000 | 1.5158 | 0.0000 |
| 7 | Mozambique | 47.2222 | 0.0000 | 0.8173 | 0.0000 |
| 8 | Namibia | 1.7714 | 0.0000 | 1.4500 | 0.0000 |
| 9 | South Africa | 0.8750 | 0.0000 | 0.8913 | 0.0000 |
| 10 | Swaziland | 1.7393 | 0.0000 | 1.8175 | 0.0000 |
| 11 | Tanzania | 5.2857 | 0.0002 | 1.6989 | 0.0000 |
| 12 | Uganda | 288.0000 | 0.0000 | 1.7160 | 0.0000 |
| 13 | Zimbabwe | 235.3383 | 0.0000 | 22.6829 | 0.0000 |
| | Total | 1.1619 | 0.0000 | 1.1962 | 0.0000 |

Table 6: Web impact factors

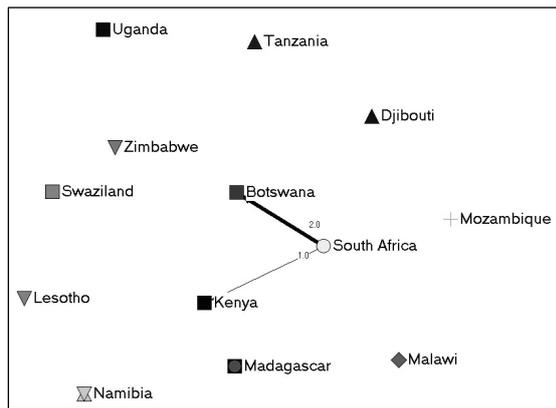


Figure 1: Government interlinkages (AltaVista)

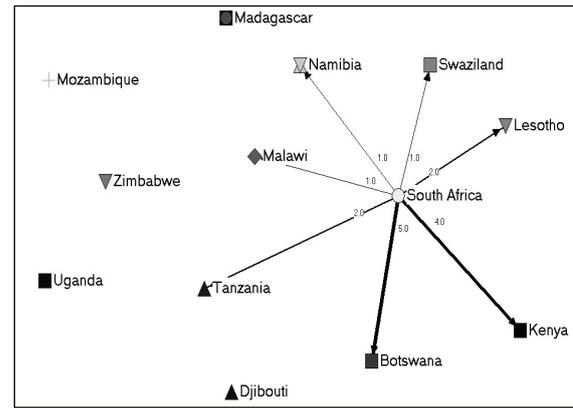


Figure 2: Government interlinkages (Google)

When the total number of government webpages was considered, it was found that Zimbabwe had the highest WIF (22.7), followed by Kenya (3.3), Botswana (3.2), Lesotho (2.1), Swaziland (1.8), Uganda (1.7), Tanzania (1.7), Malawi (1.5), Namibia (1.5), Djibouti (1.3) and Madagascar (1.1). Again, all government websites produced zero WIF in Google. Cumulatively, as shown in the last row in Table 6, the government portals produced a WIF of 1.16 while all the government websites produced a WIF of 1.20, as measured using AltaVista data. The WIF, in both cases, was nil in both AltaVista and Google.

Government interlinkages

The social networks shown in Figures 1 and 2 provide inter-site linkages among the government websites. Only the South African government provided links to other government websites, while it received none from any of the governments investigated. In AltaVista, South Africa provided two links to Botswana and one to Kenya. In Google, seven countries received links from South Africa: Botswana (5), Kenya (4), Tanzania (2) and Lesotho (2), while Malawi, Namibia and Swaziland received one link each.

Discussion and conclusions

It was observed that several governments in the region had constructed websites. Of the total of 20 countries in eastern and southern Africa, 13 (65%) provide government portals. This falls far below the expectations of many, especially in this era of technology. One may ask: Why is it that

the other seven governments in the region have not constructed their websites? Are they reluctant, or is it because they have not been enlightened about the Web's benefits?

Chisenga (2004) is of the opinion that African governments lack active involvement in Web development. It would be interesting to conduct a study to identify reasons as to why governments in Africa are not actively participating in Web development and engineering. Chisenga's study reported that 24 African governments had their own websites, of which 12 were from eastern and southern Africa. Kenya and Swaziland were excluded from his study because their websites were not accessible at the time. The same problem resurfaced during the current study, where three government websites (Djibouti, Namibia and Uganda) could not be accessed. Whether they were "dead links", or whether the servers that hosted the websites were not functional, could not be ascertained at the time of conducting the study. Nevertheless, it is worth mentioning that this scenario impacts negatively on a country's e-governance activities. As librarians like to say, "a book that is misshelved is as good as a lost book" - so any website that cannot be accessed for a prolonged period of time could just as well have been non-existent. Citizens cannot keep abreast of the goings-on in the government, nor are they able to download important documents from the website, which service e-governance is meant to provide.

Another danger of not owning a website is related to the "new forms of piracy" on the Web

(Ndioo, 2007). According to Ndioo, some individuals and companies are making huge sums of money by intentionally depriving real companies of their right to own domain names. These parties are busy registering domain names using renowned companies' names, only for them to demand that company X buys the rights from them if the latter wants to use the domain name with which the former had registered "their" company. Although this has not happened with government domain names, it is a possibility and calls for governments to register their domain names with appropriate Registration bodies, not only because of the fear that their domain names may be used by others, but also for the purposes of enhancing e-governance.

Previous studies (e.g. Chisenga, 2004) have shown that government websites are used for several reasons, some of which include informing the public of new developments in the government through such websites as the official government spokesperson's website; full-text government documents; the country's constitution; government forms (e.g. application forms for birth certificates, visas, etc.); online application facilities; government contact details; feedback facilities; frequently asked questions; and statements of responsibility. This study considered four of these features, namely feedback forms, search engines, contact details and site-maps, each of which is important in its own right and contributes to effective and successful e-governance. For instance, Chisenga (2004) and Markus (2001) observe that the interaction between the government and the public is stimulated with various applications. For example, people can ask questions via email, use search engines and download forms and documents, while feedback facilities act as discussion tools that the public can use to comment on various government policies and decisions. It was encouraging to note that most of the aforementioned four features were provided by all the accessible government websites. The most noticeable was the availability of contact details (telephones, emails and persons to be contacted) on all these websites.

It is well acknowledged that language, among other factors, affects the usability or "citedness" of a document (Garfield, 1993). It is therefore important to state that one of the factors that may determine the usability of a website or webpage

is the language¹ in which it is constructed, thereby affecting the citedness/linkage of the website or webpage. Consequently, international recognition is limited if the website is in a language that is not international. It was observed that English was the language in which most websites were prepared, probably because of its international use. The other languages included Portuguese, French and Arabic. Countries' use of these languages in preparing their government websites and as official languages of communication can be attributed to the nations that were colonial masters in those countries. One would argue that local national languages (such as Swahili, isiZulu, Afrikaans, etc.) should be used to prepare alternative websites to the ones using an international language. Although this may improve e-governance, it is debatable whether or not it is necessary, given that most citizens who use the Web are well versed in the official language of communication in their countries.

Concerning the gTLDs, consistency in the use of several variations of the gTLDs in a given country was observed. For instance, in Kenya, the use of .co, .or and .ac for companies, organisations and academic institutions was observed, while South Africa uses .co, .org and .ac respectively. While some countries used .gov (e.g. South Africa and Zimbabwe), others such as Angola used several variations for one type of institution (e.g. .gov and .gv for government institutions). Southern African countries largely used .org and .gov, as opposed to eastern African countries, which largely used .or for non-governmental organisations (NGOs). Uganda was the exception, using both .or and .org for non-profit-making organisations. Worth noting too was the dominance in each country of .co or .com for commercial organisations.

Commercial organisations' webpages totalled 9 597 755 (Google) and 18 921 281 (AltaVista), accounting for 82.5% and 83.9% of the total webpages for the five gTLDs respectively. The government webpages were favourably represented in each country, yielding a total of 706 212 (6.1%) and 551 698 (2.4%) pages in Google and AltaVista respectively. This was

¹ Language here does not refer to computer language (i.e. the system of commands used to develop software), but natural language (English, French, Arabic, Afrikaans, Swahili, etc.).

deemed to reflect the real situation in each country where there are more commercial companies than government institutions or any other type of institutions, such as NGOs and academic/educational institutions, and has nothing or very little to do with the preference of either .com or .co as TLD.

Another aspect that was considered when studying the government websites was the date of copyright or update. This analysis did not yield comprehensive results because most government websites did not provide either of the dates. However, results from those that provided these dates showed that all the websites were up to date. It is recommended that all websites should provide the dates of copyright and/or update, as these dates not only reflect how current the website is but, in scholarly publishing, the date of publication is crucial especially when it comes to citation. It will also show professionalism in website and webpage construction on the part of the webpage authors.

Table 4 shown earlier also provides the number of webpages on the government and government-related institutions' websites. As mentioned, all but seven countries in eastern and southern Africa owned government portals. The most productive of the institutions were foreign missions, followed by government ministries, political parties, and the national assembly. This pattern of distribution is typical of any country where foreign missions and political parties are several, while such institutions as the offices of presidents or prime ministers, national assemblies and even ministries in a country would be one each. In fact, one would not find, for instance, two offices of the presidency, the prime minister, a certain government spokesperson, and so on. There is normally one office for each of these institutions. Even when there are two deputies in a particular office, they will always be classified under the name of the respective office. In addition, it is most probable that foreign missions, especially those based in developed countries, would find it convenient and compelling to prepare their own websites because of the environment in which they are operating.

Developed countries provide enabling or conducive conditions, facilities and expertise for the construction of websites. For instance, one does not need to labour so much to convince the administration of foreign missions about the

need to have an own website. Other factors that may contribute to the construction of more websites for foreign missions than any other government and/or government-related institutions could be advanced technology and expertise, which are readily available in developed countries.

Results from an analysis of the number of webpages in, and links to, government portals show, as expected, that these portals yielded fewer webpages and in-links than all the government websites put together. Again, the AltaVista search engine produced more webpages and in-links for each government than Google. In fact, Google produced zero in-links for most of the governments in the region. Commenting on this type of pattern, Thelwall (n.d.) says that Google only reports a fraction (about 10%) of links that the search engine is aware of, which may explain why it produced less links to eastern and southern African governments. South Africa was the most prolific, as well as most linked to, (sited) government. Others that yielded a large number of webpages and in-links include Botswana, Lesotho, Namibia, Swaziland and Tanzania.

Impact-wise, as shown in Table 6 earlier, the situation was almost the opposite of the above. Countries with fewer webpages and a large number of in-links produced higher WIFs than their counterparts. This analysis saw Djibouti leading with a WIF of 701 (from only one webpage and 701 in-links) in AltaVista, followed by Uganda (288) and Zimbabwe (235).² Collectively, all government websites, including those belonging to government-related institutions (as long as they contained .gov or .go TLDs), yielded the highest WIF for Zimbabwe (22.7) in AltaVista, followed by Kenya (3.3) and Botswana (3.2). Again, Google yielded a zero WIF for most governments. This perhaps illustrates why impact factors should be used with care when assessing the quality of websites, webpages or documents, because a country such as Djibouti, which yielded only one webpage, produced the higher WIF than South Africa, which had 416 000 webpages.

With regard to government inter-linkages, it was observed that only the South African government

² It is worth noting that, in this case, we analysed all in-links, including self-links.

provided links to other governments that were investigated. All links to the other eastern and southern African governments originated from the Association of Law Reform Agencies of Eastern and Southern Africa at the Department of Justice in South Africa. The website (www.doj.gov.za/alraesa/contacts/) provides contact information of the member countries. There were no government-to-government links, i.e. links from one government portal to another. These links need to be created, especially now that countries in Africa have come together to form the African Union and other regional organisations such as the Southern African Development Community (SADC), East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA) and the Pan-African Parliament (PAP), which brings together parliamentarians from all over Africa.

Interestingly, while we encourage African countries to make use of ICTs in the administration of e-governance, it is worth noting that the major impediment to the use of these tools lies with the public, who could be incompetent in ICT usage. This is a hindrance not only in developing countries, but also in developed countries. For instance, the UK *Financial Times* of 22 May 2006 reported:

The UK is still struggling to get the public to use online and other electronic forms of government in spite of multi-billion pound investments in them.

A larger population of African countries does not have access to ICTs, and even when they do, citizens are often incapable of fully utilising these tools due to their low level of literacy, in general, and computer literacy, in particular. E-governance will be successful if the African governments move fast to solve the myriad problems that may hinder the effective use of ICTs in the region, such as poor telecommunication infrastructure, illiteracy levels, poverty, and computer or ICT "phobia".

Finally, we focus our attention on ethical issues in relation to the variables outlined and discussed in the sections above. Firstly, while we would commend various governments for constructing websites and making various documents available on the Web, it is advisable that these be published in several languages to cater for the majority needs just as for those in "real space". Unlike in cyberspace, where individuals

access and interpret Web documents by themselves, in "real space" they are assisted by designated government officers, especially when it comes to the completion of forms. This is all the more reason why web documents should be prepared in simple formats, as well as in a language that is easily understood by most citizens.

Secondly, in information ethics, two interrelated factors affect access to information: the right of access, and free access (Ackerman & Britz, 2006). In this regard, governments should formulate policies governing these two issues. The big question, though, is which and how much information the government should allow free access to without compromising the security of data and the nation or country at large. It should be remembered that good governance or democracy is defined in terms of transparency and accountability. This study did not delve into the content of government websites in detail, but in regard to the four features analysed, it was noted that most government websites offer feedback forms, contact details, sitemaps and search engines. These are fundamental basic features that should be provided by all government websites. Another factor that affects free access, as mentioned above, is the provision of active links. Webpage authors should therefore ensure that all links to and from government websites are operational.

Thirdly, as MacDonald (1995) notes, one of the web-based features with ethical importance is what he terms "clarity of administrative responsibility". He argues that websites should clearly state the owner(s), i.e. the persons responsible for the sites' administration. The same applies to government websites. It was encouraging to note that all government websites investigated in this study indicated ownership and/or administrative responsibility. Related to this is the date of copyright or date of update, which should be considered and published on each government website.

Lastly, we borrow an argument from Rose (2005: 2-3) regarding situations where several government institutions have independent websites, as was witnessed in this study:

At its worst, each agency of a government may have its own processes controlling interaction with those it serves and distinctive information technology that is not readily compatible with other

public agencies. While a single agency may be able to introduce e-governance services, citizens will be frustrated if they must sign on and off a number of different web sites when their requests involve a multiplicity of national and local offices of government.

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